

FOS CDR RID Report

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Originator Bob Schutz

Phone No 512-471-4267

Organization Univ. of Texas

E Mail Address schutz@utcsr.ac.utexas.edu

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Review FOS

Originator Ref

Priority 2

Section

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Figure Table

Category Name Analysis Design

Actionee ECS

Sub Category

Subject Time Source

Description of Problem or Suggestion:

Two alternate ways of synchronizing to UTC are assumed, one of which is based on TDRSS. Some future missions have requirements better than one microsecond. Furthermore, an independent, and more accurate, backup would be useful.

Originator's Recommendation

GPS time transfer has been operationally demonstrated to provide better than 0.1 microsecond. A source of information (and hardware) is at GSFC: Dr. Tom Clark in the VBLI Group. HB time transfer unit - (totally accurate clock, TAC) is used at Goddard's laser ranging stations.

GSFC Response by:

GSFC Response Date

HAIS Response by: Andy Miller

HAIS Schedule

HAIS R. E. Scott Carter

HAIS Response Date 11/10/95

The time reference utilized by the FOS, as defined in the baseline requirements, is obtained from the government furnished NASA-36 bit serial time code signal. The NASA-36 time reference is available at the EOC and IST's with an accuracy of 500 milliseconds. The design of the IST does not preclude the on-site purchase of a GPS to serve as the local time source for future missions requiring time accuracy of better than 0.1 microseconds.

Time synchronization between the EOC and ISTs is achieved over the NSI via the Distributed Time Services (DTS). The DTS consists of time servers and time clerks. The NASA-36 time reference is fed to the DTS servers. EOC and IST workstations will contain a DTS time clerk to receive time transferred over NSI by the DTS server. The DTS time clerk at each workstation updates the system clock rate to synchronize the workstation system clock with the source time. The DTS time clerk applies an algorithm during synchronization to account for nominal delays in transfer through NSI. The algorithm associated with the DTS is configurable and delays through NSI are expected to fall within the envelope of the 500 millisecond accuracy requirement. In support of future missions, the DTS clerk can be switched to allow for time to be served from a source outside the scope of the FOS, such as GPS, which satisfies the future accuracy requirements.

Status Closed

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***** Attachment if any *****